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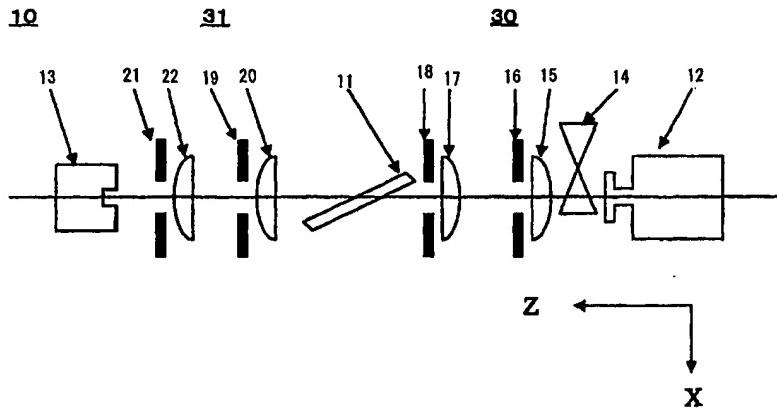
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(54) Title: METHOD AND INSTRUMENT FOR MEASURING COMPLEX DIELECTRIC CONSTANT OF SAMPLE BY OPTICAL SPECTRUM MEASUREMENT

(54) 発明の名称: 光学スペクトルの測定による試料の複素誘電率測定方法及び測定装置



$$\frac{2\pi d \sqrt{1 - (\sin \theta/n)^2}}{\lambda} = N \quad (\text{Eq. 7})$$

(57) Abstract: A substrate like a parallel flat plate satisfies the inference condition when the wavelength ( $\lambda$ ) of the incident light satisfies [Eq. 7] (where  $d$  is the thickness,  $n$  is the refractive index,  $\theta$  is the angle of incidence, and  $N$  is an integer). In this case, in the transmission spectrum, the lights strengthen each other and a peak of the fringe appears; in the reflection spectrum, the lights weaken each other and a bottom of the fringe appears. At wave lengths (frequencies) near the wavelength ( $\lambda$ ), as the angle of incidence is increased, the transmittance approaches zero and the reflectance approaches 1. Increase of the thickness by placing a thin film on the substrate is similar to increase of the thickness of the substrate in [Eq. 7], and therefore the wavelength satisfying the interference condition shifts to the longer wavelength (low frequency) side. Owing to these three effects, the spectrum of the ratio of the optical spectrum of the system composed of the substrate and the thin film to the optical (transmission or reflection) spectrum of only the substrate at a large angle of incidence is a spectrum having a structure where the maximum value is adjacent to the minimum value. By analyzing the relative transmission or reflection spectrum, the complex dielectric constant of the thin film can be determined.

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